

January 30, 2006

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Re: CS Docket No. 97-80 (Interoperability Testing)

Dear Ms. Dortch:

This document was originally filed on January 30, 2006, but due to a typo in the date, a corrected version was resubmitted on January 31, 2006.

In its Second Report and Order in CS Docket No. 97-80, FCC 05-76, 20 FCC Rcd 6794 (rel. March 17, 2005), the Commission directed that the Consumer Electronics Association and the National Cable and Telecommunications Association file joint reports on status and progress of the bi-directional negotiations beginning on December 1, 2005, and every sixty days thereafter. Since the joint report to the Commission made on November 30, 2005, the two sides have met only once (on January 17, 2006) and in that meeting discussed a single issue – application and device interoperability testing. Sony Electronics submits this letter in order to present its views and concerns with this important matter.¹

The Consumer Electronics Association has presented general arguments on interoperability testing in previous filings, and in the November 30, 2005, filing also offered a set of proposed regulations that would address its concerns. The proposal set forth below by Sony Electronics is intended to be consistent with and expand upon these previously expressed principles, based on the discussion in our January 17 meeting. Accordingly, this submission contains a summary of the scope of the problem to be addressed by a robust application and device interoperability testing regime, a recounting of the broad principles that such a regime must embody, an outline of proposed testing procedures, and a brief discussion of the related issue of software downloadable bug fixes.

¹ As the Commission is well aware, application and device interoperability testing is only one of many critical issues in these negotiations and, accordingly, any final agreement on this discrete subject can only be reached in the context of a broader agreement in which all issues are addressed.

Scope of the Problem

The Commission should not underestimate the massive challenge faced by CE manufacturers and cable providers in ensuring that a bidirectional cable television system, based upon OCAP, not just works as promised, but works at all and does not “crash” televisions. A “crashed” television set may manifest in myriad ways, including some which may not be immediately apparent to the consumer, but instead may have key functions, such as the emergency alert system (EAS), rendered inoperative as a result of the “crash”. Such cases not only constitute a nuisance to the user, but may actually present a safety risk and liability, as in the case of latent EAS inoperation or misoperation. Such problems result from the pervasiveness of OCAP in the host device, and the complexity of testing the almost infinite number of combinations of device hardware, device software, OCAP middleware implementations, MSO headend hardware, and downloadable OCAP applications. In short, the Sony Electronics is deeply concerned that the OCAP approach will be incapable of scaling beyond application to cable’s own leased set-top boxes. The cable industry’s resistance to solving the application/receiver testing challenges is evidence of this.

Neither the cable nor CE side disputes that OCAP, as currently envisioned, will manage all of the functionality of the host device when that device is legally receiving and displaying cable programming.² When an iDCR is operating in “cable mode”, the cable operator’s downloaded OCAP application(s) will exercise control over all relevant CE hardware, including the QAM tuner, the MPEG decoder, and the rendering of video content, including images and graphics. It will also direct the control of the hardware necessary to enable these components, including the Java virtual machine, central processing unit and device and video memory. As a result, OCAP will dictate all of the functionality of the device, including the processing of all remote control key presses, processor and memory management, and elements of the user interface like input selection, channel up/down, volume, direction keys and select, picture-in-picture and consumer-selected favorites. In short, when a consumer inserts a CableCARD or, presumably, attaches the device to a system having software downloadable security, OCAP will become

² In the discussions to date, the MSOs have agreed that a device would be permitted to access unidirectional cable programming without using OCAP, much like today’s unidirectional DCR products. However, operating in that mode, the product would lack access to the cable operator’s guide and any programming reached through that guide, including on-demand and switched digital programming, as well as any other services requiring the upstream communication path. Therefore, for practical purposes, an interactive cable-ready device would be under OCAP’s control whenever cable programming is being viewed.

the intelligence of the CE product and the “face” of the product to the consumer.

If the cable operator’s downloaded OCAP guide application fails in a device, the consumer will lose entirely the ability to receive and display cable programming with that device, notwithstanding the consumer’s legal entitlement to receive that programming. An improper OCAP application could, for example, overflow the memory buffer of the device, resulting in a general failure of the OCAP environment and the failure of all of the components and functionality described above. Although the device may continue to receive and display non-cable programming, the consumer would need to intervene with the device, either through changing modes of operation to a non-cable mode, if this functionality is still operational, or worse yet, perform a hardware reset of the entire device to regain access to cable, the equivalent of ctrl-alt-delete in a personal computer operating Windows. Even more problematic, if such a failure was the result of the download by the cable operator of an application containing a latent defect or that was incompatible with the particular configuration of CE device that was attached to the network, it may not be possible for the consumer to recover operation of the CE device *at all* without having the device professionally repaired to clear the offending software from the device’s memory. This is because OCAP, as specified by cable, has no provisions for determining customer acquiescence to a proposed download by an operator and no provision for customer initiated reversion to a prior configuration in the event that the customer determines misoperation or impairment of the device subsequent to a change in device configuration by the cable operator.

This potential for widespread device failures can be limited under the existing paradigm of CE manufacturer control over the design and manufacturing of the host device. Manufacturers can test their products extensively, and need only ensure compatibility with a limited set of well-established basic communications protocols. However, under client/server model embodied by OCAP, the problem becomes exponentially more difficult to manage, as control over the device is divided between the manufacturer and the cable provider.

The number of variables involved in a real-world OCAP deployment exacerbates this already difficult problem of interoperability. Assume, conservatively, that fifteen CE manufacturers will deploy OCAP-compatible devices, that each manufacturer will base its models on only three different hardware and firmware platforms and OCAP middleware stacks, that each MSO will offer only two versions of three basic unbound OCAP applications (providing, for example, an electronic program guide, video-on-demand, and pay-per-view), and that the MSOs can limit their headend hardware to 100

identical configurations nationwide, of the roughly 8000 different headends in operation today. This again conservative estimate will require testing of 27,000 different combinations of hardware, device software, downloadable applications and headend equipment. Further, it represents only the number of combinations that must be tested on the date of the initial OCAP deployment; maintaining compatibility of this initial set of devices over the 7 to 10 year lifespan expected by consumers means that the magnitude of the problem will, if anything, increase over time.

In short, meeting consumer expectations about adequate device operation in an OCAP world presents a significant, perhaps insurmountable, problem for CE manufacturers and cable providers. Given its pervasive control over product functionality, OCAP can result in substantial, even catastrophic, device failures. Given the enormous number of permutations of hardware and software in an OCAP-based, client-server network, it will be difficult, if not impossible, to control for and test all of the complexity in the system. Accordingly, the task of CE manufacturers and cable providers will be to develop a testing regimen that is sufficiently robust to manage this risk and complexity. Further, in the event of an in-home failure of one or more CE iDCR models due to some as-yet-unknown application/iDCR problem, cable will need to keep consumers' iDCRs running with MSO applications that are known to work. No such agreement has yet been reached.

Testing Principles

Even a testing program that is sufficiently robust to address the technical issues described above will not, in itself, satisfy the statutory mandate of section 629. A “separate-but-equal” regulatory structure that fails to impose equivalent burdens and responsibilities on both CE and cable will inevitably produce an unfair competitive advantage for the privileged side. Further, any testing process must be subject to joint control and administration, must include a fair and open process for the adjudication of good faith disputes, and must be funded accordingly. Finally, although testing will likely need to be centralized in its initial stage, the program should move toward a more decentralized model, with the ultimate goal of self-certification of products by manufacturers. Adherence to these principles will help ensure that consumers will enjoy the benefits of both robust devices and a robust market for these devices.

As the Commission has recognized, consumers benefit when all parties that have control over a technology also have an incentive to ensure that the technology functions properly. The Commission has enshrined this principle, known as common reliance, in its rules requiring the separation of conditional access functionality from other device functionality in cable-deployed set-top boxes. Common reliance ensures that all participants in a market will benefit or suffer on a level playing field, irrespective of who holds control over the technological underpinnings of that market.

Common reliance retains its fundamental importance in the context of device and application interoperability testing. In practice, it means that all CE devices and cable devices must operate on a single network relying the same technologies, rather than separate networks with different technologies. Further, it requires that all devices attached to an OCAP-enabled network, whether deployed by a CE manufacturer or cable provider, must pass the same tests before deployment. It also means that all device manufacturers, CE or cable, must have an equal opportunity to test applications deployed on those devices. These instantiations of the principle of common reliance will produce the level playing field necessary to ensure the development of a truly competitive market for navigation devices. Lastly, it means that the consumer has the right to expect that the CE devices they buy at retail – their property – will not be impaired or harmed through actions of the cable provider and that the applications downloaded to the device will, at a minimum, allow the device to continue to operate exactly as expected when they purchased the device. Even this is a minimum requirement that does not encompass the original intent as expressed by the cable industry – that CE OCAP-based iDCRs would accept and run new and

upgraded applications as they are made available, just as the cable operators' leased set-top boxes will.

Common reliance alone, however, will not ensure a level playing field if one side or the other exercises sufficient control over the testing and certification process to tilt the playing field in its favor. Accordingly, common reliance in a competitive market demands that all parties with an interest in the market have equal input into and control over the development and execution of the testing process. Disputes that arise in the course of testing and certification must be adjudicated in a fair and reasonable manner, which affords due process and a decision from an impartial decision-maker. Finally, funding of the testing process must be both adequate to ensure the necessary robustness, but also divorced from control over that process, with costs shared proportionately by all interested parties.

Finally, although all sides concede that development of a robust and fair regime will initially require centralized testing and certification, all parties will benefit from lessons learned during this initial phase. Both CE manufacturers and cable providers will likely move toward standardization, as technologies prove themselves in the marketplace. It is possible, for example, that manufacturers will ultimately settle on a manageable number of thoroughly tested and reliable OCAP middleware implementations. Similarly, cost and network management pressures will likely result in greater homogeneity of MSO headend hardware configurations over time. These pressures will certainly lessen and likely eliminate the need for centralized testing and certification, thereby allowing manufacturers to design, test and certify products internally and avoid the inefficiencies of a central facility.

Proposed Testing Procedures

Based on the foregoing, CE manufacturers believe that the testing and certification regime outlined below adequately addresses the enormous problem presented by OCAP, and embodies the principles necessary to ensure adequate functioning of a competitive device marketplace.

1. Voluntary Test Facility

The proposed testing regime envisions the creation of an ongoing, voluntary testing facility for the testing of interoperability between devices, headends, and applications. The purpose of the facility will not be to pass or fail the provided devices, headends, and applications, and will not serve as a mechanism for excluding features and functionality from the market. Rather, the voluntary testing facility will allow all interested parties to

address incompatibilities in the system in advance of formal, pass/fail certification. Parties can address bugs in their products or applications during their design phase, with the goal of streamlining the final certification process. All participants must contribute to the voluntary test facility as follows:

- All manufacturers of OCAP-enabled devices, regardless of whether such devices will be offered for retail sale or for rental on an OEM basis, shall provide at least one fully functional prototype to the voluntary test facility. Manufacturers may provide additional prototypes to the facility, but shall pay a flat-rate fee for each such additional product.
- All cable providers that deploy OCAP on their networks shall provide at least one replica of every currently deployed and available headend configuration, but not more than ten such headend configurations, to the voluntary test facility.
- Each cable provider that deploys OCAP-based unbound applications (*e.g.* electronic program guides, VOD or PPV applications) shall provide a fully functional and reasonably final version of such application to the voluntary test facility no less than sixty days prior to deployment of the application on its network, and shall provide a final version of such application to the voluntary test facility upon deployment of the application on its network.

All device manufacturers, cable providers and bound or unbound application providers shall have reasonable and non-discriminatory access to the voluntary test facility for the testing of new products and applications. Manufacturers and providers shall have an opportunity to test as many permutations of devices, headends and applications as they deem necessary. Device manufacturers and application providers shall pay a flat per-device or per-application fee to participate in the voluntary facility, as well as a per-test fee. Such fees shall be determined proportionately, in light of the total cost of maintaining the facility, and shall be subject to the ultimate approval of the Commission through a public notice-and-comment process.

2. Required Test Facility

Before an OCAP-enabled device or application can be made available to the public, it must pass through a second, more stringent testing facility. Although the tests will be mandatory for both devices and applications, the facility will not test device-application interoperability *per se*. Rather, it will

test devices and applications against a software test suite, in the case of devices, or a hardware test suite, in the case of applications.

The software test suite shall be designed and administered by representatives of cable and application providers, and the hardware test suite shall be designed and administered by representatives of device manufacturers. The design and administration of both test suites shall be overseen by a single board of directors, comprised of an equal number of representatives from the CE and cable industries. Decisions of the board shall be final, but shall be subject to appeal to the Commission in the case of a deadlock. The test suites shall be updated from time to time, but in no event less than once per year. The hardware test suite shall ensure application compatibility not just with currently available devices, but also with devices that have passed the required test facility during the previous seven years.

The test suites shall only determine whether a device or application functions reasonably, and shall not address whether the device or application functions well or perfectly. For example, the tests should determine whether a device or application changes channels within a reasonable time, consistent with consumer expectations, but shall not require that a device or application changes channels quickly.

Device manufacturers and application providers shall pay a flat annual fee, as well as a per-device or per-application fee to participate in the required test facility. Such fees shall be determined proportionately, in light of the total cost of maintaining the facility, and shall be subject to the ultimate approval of the Commission through a public notice-and-comment process.

Having cited all of the above requirements, it remains to be seen whether a testing and support regime can be designed that is financially feasible for the limited business model available to CE manufacturers. It is quite possible that many of the fixed characteristics of the cable industry's OCAP system will make it impossible for any CE manufacturer to support its products successfully. It should be recalled that the OCAP system was originally conceived to support only leased set-top boxes, not consumer products. This claim was made later by the cable industry after Section 629 made retail availability a requirement, and remains unproven after many years.

Bug Fixes

Finally, even the robust testing regime described above cannot result in perfect compatibility of OCAP-enabled devices and applications. To meet consumer expectations post-purchase, competitive products must have the ability to have their internal software updated occasionally to fix “bugs” discovered in the field, regardless of whether such bugs result from inadequacies in product or application design.

Accordingly, Sony Electronics would like to echo the proposals previously offered by CEA in the November 30th filing to allow such updates, specifically: (a) provision of a direct connection between the product and the manufacturer’s web site using the required built-in DOCSIS modem to be used solely for delivering such updates; or (b) delivering these updates in a combined preformatted stream directly to cable’s central application distribution centers for delivery to CE products similar to the way that cable delivers its own applications and updates. If either pathway were made available on a reasonable and non-discriminatory basis, CE manufacturers would consider agreeing to pay a reasonable fee for any bandwidth used in the process, consistent with the carriage fees charged for in analogous circumstances.

Respectfully submitted,
/s/
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Sony Electronics Inc.